UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,619	03/31/2001	Joshua T. Goodman	1018.114US1	6968

7590 03/10/2005		EXAMINER
Joseph R Kelly		WOZNIAK, JAMES S

Joseph R Kelly
Westman Champlin & Kelly PA
900 Second Avenue South
International Centre Suite 1600
Minneapolis, MN 55402-3319

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/823,619	GOODMAN, JOSHUA T.
	Examiner	Art Unit
	James S. Wozniak	2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>31 March 2001</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>31 March 2001</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 1-04)   Office Action Summary   Part of Paper No./Mail Date 20041028

DETAILED ACTION

Double Patenting

1.   The nonstatutory double patenting rejection is based on a judicially created doctrine

grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

improper timewise extension of the "right to exclude" granted by a patent and to prevent possible

harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.

Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686

F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA

1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to

overcome an actual or provisional rejection based on a nonstatutory double patenting ground

provided the conflicting application or patent is shown to be commonly owned with this

application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal

disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37

CFR 3.73(b).

2.   **Claims 1-44** are provisionally rejected under the judicially created doctrine of

obviousness-type double patenting as being unpatentable over claims 1-33 of copending

Application No. 09/823,580 in view of Gilai et al *(U.S. Patent: 6,018,736)*. Gilai teaches the

additional features of 09/823,580 (cost between a key input and a word candidate) as a similarity

probability and corresponding threshold *(Col. 7, Lines 10-35)* and is obvious in combination with

the present invention for the benefit of presenting a user with a concise list of most probable

word candidates to implement text disambiguation.

This is a <u>provisional</u> obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
> sale in this country, more than one year prior to the date of application for patent in the United States.

4.   **Claims 1-7, 14, 34-36, and 41-43** are rejected under 35 U.S.C. 102(b) as being

anticipated by Skiena et al *(U.S. Patent: 5,828,991)*.

With respect to **Claim 1**, Skiena discloses:

Receiving key input corresponding to the word, the key input having at least one of a left

context and a right context *(Col. 5, Lines 1-17, and Fig. 3)*; and

Determining the word corresponding to the key input by using a machine learning

approach with a language model based on one or more of the at least one of the left context and

the right context of the key input *(Col. 5, Lines 1-17, Col. 9, Lines 35-50, and Fig. 7)*.

With respect to **Claim 2**, Skiena shows:

The reduced keypad is a numeric keypad *(Fig. 2)*.

With respect to **Claim 3**, Skiena recites:

The key input has at least the left context, and the word corresponding to the key input is determined by using the machine learning approach based on the left context of the key input *(Col. 9, Lines 35-50, and Fig. 7)*.

With respect to **Claim 4**, Skiena discloses:

The key input has at least the right context, and the word corresponding to the key input is determined by using the machine learning approach based on the right context of the key input *(Col. 9, Lines 35-50, and Fig. 7)*.

With respect to **Claim 5**, Skiena recites:

The key input has both the left context and the right context, and the word corresponding to the key input is determined by using the machine learning approach based both on the left context and the right context of the key input *(Col. 9, Lines 35-50, and Fig. 7)*.

With respect to **Claims 6 and 7**, Skiena recites:

The language model comprises using an n-gram model, wherein the n-gram model is a bigram model *(Col. 10, Lines 12-14)*.

With respect to **Claim 14**, Skiena discloses:

The key input has both the left context and the right context and has a plurality of number sequences where each sequence corresponds to a word, the plurality of words corresponding to the key input determined by using the machine learning approach based both on the left context and the right context of the key input *(Col. 9, Lines 35-50, and Figs. 3 and 7)*.

Claim 34 contains subject matter similar to Claim 1, and thus, is rejected for the same reasons.

With respect to **Claim 35**, Skiena shows:

A display on which the at least one of the left context and the right context, and the word

corresponding to the key input, are displayed *(Fig. 1, Element 20)*.

With respect to **Claim 36**, Skiena shows:

The apparatus is a telephone *(Fig. 1, Element 10)*.

Claims 41-43 contain subject matter similar to Claims 3-5, respectively, and thus, are

rejected for the same reasons.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

6.   **Claims 8 and 44** are rejected under 35 U.S.C. 103(a) as being unpatentable over Skiena

et al in view of King et al (U.S. Patent: 5,953,541).

With respect to **Claim 8**, Skiena teaches the word disambiguation method utilizing

language models, as applied to Claim 1. Skiena does not specifically suggest the use of a cache

model in addition to a language model, however King discloses:

Using a cache model *(Col. 10, Lines 17-33)*.

Skiena and King are analogous art because they are from a similar field of endeavor in

text disambiguation. Thus, it would have been obvious to a person of ordinary skill in the art, at

the time of invention, to modify the teachings of Skiena with the use of a likely word list sorted

according to frequency of use as taught by King to improve text disambiguation accuracy by

considering the frequency of use of a particular word in interpreting a most likely input text since

a frequently used word would have a higher probability of corresponding to a ambiguous

numerical input.

Claim 44 contains subject matter similar to Claim 8, and thus, is rejected for the same

reasons.

7.   **Claims 9, 15-17, 27-30, and 33** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Skiena et al in view of Bangalore et al *(U.S. Patent: 6,415,248)*.

With respect to **Claim 9**, Skiena teaches the word disambiguation method utilizing

language models, as applied to Claim 1. Skiena does not specifically suggest the use of a

compressed language model, however Bangalore discloses:

The language model comprises a compressed language model *(Col. 6, Lines 44-65)*.

Skiena and Bangalore are analogous art because they are from a similar field of endeavor

in linguistic text processing. Thus, it would have been obvious to a person of ordinary skill in

the art, at the time of invention, to modify the teachings of Skiena with the use of a pruned

language model as taught by Bangalore in order to improve text processing efficiency by

considering only those clusters having a maximum lexical significance within the compressed

model instead of an entire tree structure.

With respect to **Claim 15**, Bangalore further discloses:

Smoothing an uncompressed language model *(Col. 3, Lines 52-61)*; and

Pruning the uncompressed language model to yield the compressed language model *(Col. 6, Lines 44-65)*.

With respect to **Claim 16**, Skiena in view of Bangalore teaches the word disambiguation method utilizing compressed language models, as applied to Claims 9 and 15. Although Skiena in view of Bangalore does not specifically suggest that the pruning method utilizes one of a count-cutoffs, Rosenfeld, or Stolcke approach, the examiner takes official notice that it would be obvious to utilize one of the aforementioned specific pruning methods in the pruning process disclosed by Bangalore since all three methods are well-known, commonly used, and the means for implementation are readily available. Therefore, for the benefit of implementing a readily available and well-known pruning method, it would have been obvious to one of ordinary skill in the art, at the time of invention, to modify the teachings of Skiena in view of Bangalore with one of the previously mentioned pruning methods.

With respect to **Claim 17**, Bangalore further discloses:

Determining a normalization factor for each word in the uncompressed model only prior to pruning *(Col. 5, Lines 22-38, and Col. 9, Lines 19-22)*.

Claim 27 contains subject matter similar to Claims 1, 9, and 15, and thus, is rejected for the same reasons.

Claim 28 contains subject matter similar to Claim 2, and thus, is rejected for the same reasons.

Claim 29 contains subject matter similar to Claim 16, and thus, is rejected for the same reasons.

Claim 30 contains subject matter similar to Claim 17, and thus, is rejected for the same

reasons.

Claim 33 contains subject matter similar to Claim 20, and thus, is rejected for the same

reasons.

8.   **Claims 10, 12, and 21-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Skiena et al in view of Gilai et al *(U.S. Patent: 6,018,736)*.

With respect to **Claim 10**, Skiena teaches the word disambiguation method utilizing

language models and context information, as applied to Claim 1. Skiena does not specifically

suggest a step of adding word-probability pairs to an array and sorting said array in decreasing

probability order, however Gilai discloses such method steps *(Col. 7, Lines 10-35)*.

Skiena and Gilai are analogous art because they are from a similar field of endeavor in

text disambiguation. Thus, it would have been obvious to a person of ordinary skill in the art, at

the time of invention, to modify the teachings of Skiena with the steps of adding most likely

word-probability pairs to an array and ordering said array in decreasing probability order as

taught by Gilai in order to provide more efficient text disambiguation by only considering and

sorting a most likely set of word probability pairs for presentation to a user for the selection of an

appropriate word from an organized list.

With respect to **Claim 12**, Gilai additionally discloses:

For each word in the vocabulary that is consistent with the key input as an initial part of

the word, determining a probability of the word given the left context *(taught by Skiena with*

respect to Claim 1), and, upon determining that the probability is greater than a greatest

probability so far determined, setting the greatest probability to the probability and a greatest

probability word associated with the greatest probability to the word *(Col. 7, Line 46- Col. 8,*

Line 9, and Col. 11, Line 60- Col. 12, Line 12, and Fig. 2);

Upon determining that the greatest probability is at least a number of times greater than a

word of a first word-probability pair of the array of word-probability pairs, inserting the greatest

probability word associated with the greatest probability and the greatest probability as a new

first word-probability pair before the first word-probability pair within the array *(Col. 7, Line 46-*

Col. 8, Line 9, and Col. 11, Line 60- Col. 12, Line 12, and Fig. *2)*.

Claim 21 contains subject matter similar to Claims 1 and 10, and thus is rejected for the

same reasons. Skiena also further discloses selecting a word-probability pair having the greatest

probability *(Col. 11,Lines 52-57)* and the obvious use of a computer readable medium as applied

to Claim 20.

Claim 22 contains subject matter similar to Claim 2, and thus, is rejected for the same

reasons.

Claim 23 contains subject matter similar to Claim 10, and thus, is rejected for the same

reasons. Also Gilai further discloses selecting a highest ranked word-probability pair as

corresponding to an input text *(Col. 8, Lines 5-9)*.

With respect to **Claim 24**, Skiena in view of Gilai teaches the word disambiguation

method utilizing language models and context information, as applied to Claim 10, while Gilai

additionally discloses a candidate box featuring the most likely word probability pairs *(Col. 7,*

Lines 10-65).

With respect to **Claim 25**, Gilai further discloses:

For each word in the vocabulary that is consistent with the key input as an initial part of the word, determining a probability of the word given the left context *(taught by Skiena with respect to Claim 1)*, and, upon determining that the probability is greater than a greatest probability so far determined, setting the greatest probability to the probability and a greatest probability word associated with the greatest probability to the word *(Col. 7, Line 46- Col. 8, Line 9, and Col. 11, Line 60- Col. 12, Line 12, and Fig. 2)* ;·

Upon determining that the greatest probability is significantly more likely than a word of a first word-probability pair of the array of word probability-pairs, adding the greatest probability word associated with the greatest probability and the greatest probability as a new first word-probability pair to the array *(Col. 7, Line 46- Col. 8, Line 9, and Col. 11, Line 60- Col. 12, Line 12, and Fig. 2)*.

With respect to **Claim 26**, Skiena teaches the word disambiguation method utilizing language models and context information, as applied to Claim 1, while Gilai teaches the greatest probability determination method as applied to Claim 25.

9.   **Claims 11 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Skiena et al in view of Gilai et al, and further in view of King et al.

With respect to **Claim 11**, Skiena in view of Gilai teaches the he word disambiguation method utilizing language models, context information, and an ordered list of most likely word-probability pairs, as applied to Claim 10. Skiena further teaches the bigram model as applied to Claim 7, while King additionally teaches the cache model as applied to Claim 8. The aforementioned prior art is from a similar field of endeavor in linguistic text processing and the

teachings of Skiena in Gilai are obvious in combination with King for the reasons given with

respect to Claim 8.

Claim 13 contains subject matter similar to Claim 11, and thus, is rejected for the same

reasons.

10.   **Claims 18, 19, 31, and 32** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Skiena et al in view of Bangalore et al, and further in view of King et al.

With respect to **Claim 18**, Skiena in view of Bangalore teaches the word disambiguation

method utilizing compressed language models, as applied to Claim 15. Skiena in view of

Bangalore does not specifically suggest that pruning an uncompressed language model accounts

for ambiguous words, however King recites:

Pruning the uncompressed language model accounts for ambiguous words in the

uncompressed model *(Col. 14, Lines 9-63, and Fig. 9A)*.

Skiena, Bangalore, and King are analogous art because they are from a similar field of

endeavor in linguistic text processing. Thus, it would have been obvious to a person of ordinary

skill in the art, at the time of invention, to modify the teachings of Skiena in view of Bangalore

with the method of eliminating branches of a tree structure for an ambiguous numerical text

input corresponding to multiple words as taught by King in order to provide more efficient

memory usage by reducing the size of a language model for an ambiguous text input from a

numerical keypad.

With respect to **Claim 19**, King additionally recites:

Pruning the uncompressed language model accounts for an effect of the pruning on key

input accuracy *(Col. 14, Lines 9-63)*.

Claim 31 contains subject matter similar to Claim 18, and thus, is rejected for the same

reasons.

Claim 32 contains subject matter similar to Claim 19, and thus, is rejected for the same

reasons.

11.   **Claims 20, 37-39, and 40** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Skiena et al.

With respect to **Claim 20**, Skiena teaches the word disambiguation method utilizing

language models, as applied to Claim 1. Although Skiena does not specifically suggest method

storage as a computer program on a computer readable medium, the examiner takes official

notice that it would have been obvious to one of ordinary skill in the art, at the time of invention,

to do so in order to increase method compatibility and usability by providing a means for method

use with multiple computer systems.

With respect to **Claims 37-39**, Skiena teaches the word disambiguation apparatus

utilizing language models and context data, as applied to Claim 34. While Skiena does teach an

apparatus embodiment as a telephone as applied to Claim 36, Skiena does not teach that the

telephone is a mobile phone, specifically a cellular phone or that the device is a PDA, however,

the examiner takes official notice that it would have been obvious to one of ordinary skill in the

art, at the time of invention, to implement such embodiments in order to provide a practical and

portable word disambiguation system for use in widely used and well-known portable text

messaging applications. Therefore, in order to provide a practical and portable text

disambiguation means, it would have been obvious to one of ordinary skill in the art, at the time

of invention, to modify the teachings of Skiena with cellular phone and PDA apparatus

embodiments.

Claim 40 contains subject matter similar to Claim 20, and thus, is rejected for the same

reasons.

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure:

- Su et al *(U.S. Patent: 5,418,717)*- teaches text disambiguation using language models.

- Connolly et al *(U.S. Patent: 6,005,495)*- discloses a method for intelligent text entry
  using a numeric keypad.

- Brand *(U.S. Patent: 6,621,424)*- teaches a predictive keyboard apparatus.

- Goodman et al *(U.S. Patent: 6,782,357)*- discloses a method for obtaining compressed
  language models.

13.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to James S. Wozniak whose telephone number is (703) 305-8669

and email is James.Wozniak@uspto.gov. The examiner can normally be reached on Mondays-

Fridays, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Doris To can be reached at (703) 305-4827. The fax/phone number for the

Technology Center 2600 where this application is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the technology center receptionist whose telephone number is (703) 306-

0377.

James S. Wozniak
2/24/2005

David L. Ometz
Primary Examiner